

EARTH OBSERVATION SYMPOSIUM (B1)  
Earth Observation Sensors and Technology (3)

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## CMOS-TDI DETECTOR FOR MULTI-SPECTRAL AND HIGH-RESOLUTION IMAGING

**Abstract**

The Institute of Optical Sensor Systems (OS) at the Robotics and Mechatronics Center of the German Aerospace Center (DLR) has more than 30 years of experience with high-resolution imaging technology. This paper shows the institute's scientific results of the leading-edge detector design CMOS in a TDI (Time Delay and Integration) architecture. This project includes the technological design of future high or multi-spectral resolution spaceborne instruments and the possibility of higher integration. DLR OS and the Fraunhofer Institute for Microelectronic Circuits and Systems in Duisburg were driving the technology of new detectors and the FPA design for future projects, new manufacturing accuracy and on-chip processing capability in order to keep pace with the ambitious scientific and user requirements. In combination with the engineering research, the current generation of space borne sensor systems is focussing on VIS/NIR high spectral resolution to meet the requirements on earth and planetary observation systems. The combination of large swath and high-spectral resolution with intelligent synchronization control, fast-readout ADC chains and new focal-plane concepts open the door to new remote-sensing and smart deep space instruments. The paper gives an overview over the detector development and verification program at DLR on FPA level, new control possibilities for CMOS-TDI detectors in synchronisation control mode, and key parameters like PRNU, DSNU, MTF, SNR, linearity, spectral response, quantum efficiency, flatness will be discussed in detail.